

Gap Areas Identified by PEGASAS During Phase I Research



FAA



Gap Areas Identified by PEGASAS During Phase I Research

- **Knowledge Gaps**
 - ✦ Acquisition through Skill / Training
- **Skill Gaps**
 - ✦ Application of Knowledge through Training and experience
- **Ability Gaps**
 - ✦ Natural or acquired ability to perform Skills
- **Training Gaps**
 - ✦ Structured activities to inform, instill, and enhance KS
- **Assessment Gaps**
 - ✦ Formal evaluations to determine current capabilities in KSA areas
- **Technology Gaps**
 - ✦ Available software or hardware tools to support actual flight or training activities, including pilot KSA
- **Information Presentation Gaps**
 - ✦ Capability of available software or hardware tools to provide information suitable to enhance or expand pilot KSA during flight

PEGASAS Phase II Research (Address Phase I Identified Gaps)

- **Knowledge Gaps**

- ✦ **Gap 1:** Lack of training (mainly due to little opportunity) for student pilots to fly in and experience different weather patterns and their associated visual and other cues.
- ✦ **Gap 2:** GA pilots often do not understand the limitations of the technology in the cockpit.

- **Skill Gaps**

- ✦ **Gap 3:** There is a perceived gap in skills related to VFR-into-IMC decision-making.
- ✦ **Gap 4:** Lack of Situational Awareness relating to VFR-into-IMC..
- ✦ **Gap 5:** Retention of weather knowledge was identified as a gap.

- **Ability Gaps**

- ✦ **Gap 6:** Lack of ability of pilots to correlate, interpret and apply weather information related to VFR-into-IMC Weather Factors, specifically convection, icing, lowered ceilings, quickly emerging weather events, precipitation, or pilot-reported turbulence

PEGASAS Phase II Research (Address Phase I Identified Gaps)

- **Training Gaps**

- ✦ **Gap 7:** Existing pilot training activities do not provide pilots with adequate exposure to the impact of adverse weather events, information latency, or information resolution on the hazards of flying VFR-into-IMC or adverse weather conditions. (Source: Survey / Focus Groups / Past Literature).
- ✦ **Gap 8:** Existing pilot training activities to not sufficiently develop or improve KSAs regarding adverse weather events, information latency, or information resolution on the hazards of flying VFR-into-IMC or adverse weather condition

- **Assessment Gaps**

- ✦ **Gap 9:** Pilot applicants taking written knowledge certification examinations can fail all weather questions but still pass the examinations.
- ✦ **Gap 10:** No specific guidance on weather knowledge assessment in the Flight Review FAR §61.56.

PEGASAS Phase II Research (Address Phase I Identified Gaps)

- **Technology Gaps**

- ✦ **Gap 11:** Identification of adverse weather event triggers (and impact on pilot planning efforts) differs between out the window and mobile device / software application presentations of weather conditions; differences in awareness of trigger severity and potential impact affects pilot planning task and time sequences.
- ✦ **Gap 12:** Existing, commercially available aviation training device (ATD) simulators, regardless of certification level, do not present NEXRAD or other weather information with the latencies commonly experienced during actual flight

PEGASAS Phase II Research (Address Phase I Identified Gaps)

- **Information Presentation Gaps**

- ✦ **Gap 13:** The effectiveness of available mobile device and software application tools is affected in unknown ways due to timely availability of tool features and high-salience alerts. (Source: Past Literature / Technology Evaluation).
- ✦ **Gap 14:** Information presentation and interface design in some mobile devices and software applications may limit or prevent pilot planning activity in potentially degrading ways during adverse or degrading weather conditions. (Source: Past Literature / Survey / Technology Evaluation).
- ✦ **Gap 15:** Updates to flight conditions after a pilot obtains a flight briefing may not be communicated in a timely manner to pilots.

Specific Gaps Addressed by WTIC Research



FAA



Specific Gaps Addressed by WTIC Research

- There is a need for attention-orienting cues to call attention to or ‘highlight’ when new information is available.
 - + Gap Category: info content, rendering, technology
 - + Research Activity: PEGASAS, WTIC I-V, Adverse Alerting
- Pilots are not making (when conducting VFR operations) early enough decisions to avoid instrument meteorological conditions: visibility below three statute miles and/or clouds lower than 1000 feet above ground level
 - + Gap Category: training
 - + Research Activity: WTIC IV, PEGASAS
- Existing, commercially available aviation training device (ATD) simulators, regardless of certification level, do not present NEXRAD or other weather information with the latencies commonly experienced during actual flight.
 - + Gap Category: info content, rendering, technology
 - + Research Activity: ERAU, PEGASAS, ATSC NEXRAD Latency

Specific Gaps Addressed by WTIC Research

- Identification of adverse weather event triggers (and impact on pilot planning efforts) differs between out the window and mobile device / software application presentations of weather conditions; differences in awareness of trigger severity and potential impact affects pilot planning task and time sequences.
 - ✦ **Gap Category:** info content, rendering
 - ✦ **Research Activity:** PEGASAS, ERAU, NEXRAD Course, ROMIO?, EDR Uplink?
- Pilot applicants taking written knowledge certification examinations can fail all weather questions but still pass the examinations.
 - ✦ **Gap Category:** standards, training
 - ✦ **Research Activity:** ERAU, PEGASAS, NEXRAD Course
- Existing pilot training activities do not sufficiently develop or improve KSAs regarding adverse weather events, information latency, or information resolution on the hazards of flying VFR-into-IMC or adverse weather condition
 - ✦ **Gap Category:** training, standards
 - ✦ **Research Activity:** PEGASAS, NEXRAD Course, ERAU

Specific Gaps Addressed by WTIC Research

- Existing pilot training activities do not provide pilots with adequate exposure to the impact of adverse weather events, information latency, or information resolution on the hazards of flying VFR-into-IMC or adverse weather conditions.
 - + Gap Category: training, standards
 - + Research Activity: PEGASAS, NEXRAD Course, ERAU
- Retention of weather knowledge was identified as a gap
 - + Gap Category: training, standards
 - + Research Activity: PEGASAS
- Lack of training (mainly due to little opportunity) for student pilots to fly in and experience different weather patterns and their associated visual and other cues
 - + Gap Category: standards
 - + Research Activity: PEGASAS, NEXRAD Course
- Shortcoming in training and guidance materials for pilots regarding adverse weather (e.g. VFR into IMC) conditions and the use of in-cockpit weather information technologies to help manage such conditions, or more importantly, help avoid such conditions
 - + Gap Category: training
 - + Research Activity: PEGASAS, ERAU, NEXRAD Course, ROMIO, EDR Uplink

Specific Gaps Addressed by WTIC Research

- **There is no standard for MET product symbology / latency (e.g. ground-based radar) or how specific weather products or notifications are depicted/presented (e.g. out the window vs cockpit presentation differ)**
 - + **Gap Category: standards, rendering**
 - + **Research Activity: PEGASAS, ATSC Capabilities, MET/AIS Datalink Study, WTIC I-IV**
- **Pilots not maintaining safe separation from adverse weather**
 - + **Gap Category: training, rendering**
 - + **Research Activity: PEGASAS, ATSC Probabilistic, WTIC II-IV, MET/AIS Datalink Study, ROMIO, EDR Uplink**
- **Current commercial rendering of MET information results in inconsistent interpretation of MET information (including timestamp)**
 - + **Gap Category: info content, rendering, training**
 - + **Research Activity: WTIC I-IV, ATSC Probabilistic, WTIC ConOps, ATSC NEXRAD, PEGASAS**
- **Current rendering of METAR information on commercially available cockpit applications results in inconsistent recognition of change of state of information**
 - + **Gap Category: rendering**
 - + **Research Activity: PEGASAS, WTIC II, ATSC Probabilistic**